

CLAIMS

- 5 1. A fuel cell stack with several fuel cells (2) of the polymer electrolyte membrane construction type which are arranged into a stack (1), with which between adjacent membrane electrode assemblies (4, 5, 6) there are provided channels (8) for a cooling fluid which are arranged essentially parallel to one another, have a parallel inflow and are open to both sides, wherein the through-flow direction of adjacent channels (8) of the same fuel cell (2) is opposite to one another.

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- 15 2. A fuel cell stack according to claim 1, wherein the inflow or outflow sides of channels (8) which lie above one another, of fuel cells (2) arranged into a stack (1), are connected in a common collector channel (11) in a conducting manner, preferably running parallel to the stack axis (9).
- 20 3. A fuel cell stack according to one of the preceding claims, wherein several collector channels (11) are arranged parallel to one another on both sides of the stack (1) in a manner such that preferably all channels (8) at the inflow side or at the outflow side run into a collector channel (11).

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- 25 4. A fuel cell stack according to one of the preceding claims, wherein the channels serve exclusively for cooling, and a gas or a fluid flows through them for cooling.
- 30 5. A fuel cell stack according to one of the preceding claims, wherein the cooling channels (8) simultaneously serve for the oxygen supply of the fuel cells (2) and are designed open towards the cathode (6) of the respective membrane electrode assembly (4, 5, 6).

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6. A fuel cell stack according to one of the preceding claims, wherein the cooling channels serve for the fuel supply of the fuel cells and are designed open towards the anode of the respective membrane electrode assembly.
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7. A fuel cell stack according to one of the preceding claims, wherein the cooling channels (8) have a clear width of less than 3 mm, preferably of about 2 mm.
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8. A fuel cell stack according to one of the preceding claims, wherein the cooling channels (8) have a length between 20 and 200 mm.
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9. A fuel cell stack according to one of the preceding claims, wherein recesses are provided within the stack (1) at the edge, which form collector channels (11).
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10. A fuel cell stack according to one of the preceding claims, wherein an elastic sealing edge surrounding a bipolar plate is provided between adjacent fuel cells (2), and wherein the collector channels (11) are formed by recesses in the sealing edges lying above one another.
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11. A fuel cell stack according to one of the preceding claims, wherein the coolant is supplied with an excess pressure of 0.1 to 10 bar or is led away with a corresponding vacuum or negative pressure.
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